



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 2  
Land, Chemicals, and Redevelopment Division, Land and Redevelopment Programs Branch  
Base Program Management Section  
290 BROADWAY  
NEW YORK, NY 10007-1866

**MEMORANDUM**

DATE: July 10, 2020

SUBJECT: Chemours Chambers Works Salem Canal and Delaware River Ecological Risk Assessment Summaries and Concerns

TO: Electronic Files

FROM: Gina Ferreira, Environmental Scientist  
LCRD, Land and Redevelopment Programs Branch, Base Program Management Section

This technical comment memo provides a summary of the ecological risk assessment issues related to the Salem Canal and Delaware River.

**History of the Salem Canal Investigations**

2007/2008 DuPont proposed a "sediment stabilization" (i.e., sediment cap) remedial action for the contaminated sediment area within the canal. NJDEP disagreed with this proposed remedial action because it was not in compliance with stated goals of the site-wide remedial strategy of the Delaware River Initiative which include focused remedial efforts on source reduction and compression of the remedial action timeline to the greatest extent practicable. NJDEP viewed removal of contaminated sediment (identified during previous investigations) as practicable source reduction. Rationale for this decision was based on the following:

- Overall, NJDEP would prefer removal of contaminated sediment in accordance with NJAC 7:26-8.1(c) to be protective of human health and the environment by achieving remediation standards, based on the concentrations of the contaminants, mobility and toxicity, presence of free and/or residual product at SWMU 63, natural resource setting, and long-term monitoring/maintenance requirements of the proposed sediment cap. In addition, NJDEP would prefer placement of unconsolidated natural material rather than the proposed engineered capping material/structure.
- Remaining concentrations of benzene, chlorobenzene, 1,4-dichlorobenzene, 1-naphthylamine, 4-chloroaniline, aniline, n-nitrosodiphenylamine, and total PAHs would be as high as five orders of magnitude above the applicable standards. NJDEP therefore concluded that the contaminated sediment would impact the benthic community and continue to be a source to groundwater contamination.
- In accordance with NJAC 7:26E-6.1(d), NJDEP has determined that removal of the contaminated sediment is practicable. DuPont has implemented sediment removal at other locations of the Chambers Work Facility site.

- In accordance with NJAC 7:26E-8.1(b)2, NJDEP has determined that the sediment cap would require heavy reliance on engineering controls (including long-term monitoring and maintenance). NJDEP would prefer a permanent remedy, such as removal, that would be implemented in a reasonable timeframe.

January 2015 – Salem Canal SLERA report prepared.

March 30, 2015 – USEPA comments on the SLERA prepared.

April 2017 - Revised SLERA report prepared.

October 2017 - USEPA comments on the SLERA prepared.

January 2018 – Chemours RTC on Revised SLERA.

March 2018 - USEPA comments on the SLERA prepared.

October 2019 - Revised SLERA report prepared.

January 2020 - USEPA comments on the SLERA prepared

### **Salem Canal SLERA Issues – USEPA**

Chemours 2015 SLERA concludes that while the SLERA identifies limited potential for adverse effects on the benthic invertebrate community within the Salem Canal, additional monitoring of exposure conditions within the BAZ is appropriate to further support the ECSM and the SLERA conclusions. A framework to evaluate the Monitored Natural Recovery (MNR) of Salem Canal sediment has been proposed by DuPont.

Fish were evaluated as a receptor of concern solely based on their “continuous contact with surface water.” The report states that “demersal fish may also be exposed to COPECs through the direct ingestion of sediment-associated prey and the incidental ingestion of sediment and pore water while foraging in sediment” however these exposure pathways were not quantified. It seems more likely that fish are present in the canal than are the semi-aquatic wildlife evaluated based on habitat conditions. Demersal fish exposure should have been evaluated and quantitated in this Revised SLERA using conservative food-chain models. The January 2018 Chemours RTC states that they will quantify dietary exposure pathways for demersal fish. Demersal fish that may be or expected to be found in the Salem Canal should be identified since the fish species present will determine the dietary prey and food chain models that will be used in the Revised SLERA.

Pore water is one item in a weight of evidence approach and is not “afforded greater weight in estimating exposure and characterizing risk to benthic invertebrates.” As stated to Chemours previously, more effective methods to evaluate exposure are toxicity testing, tissue sampling, and bioaccumulation studies.

Section 5.1.2 states that sediment data for perfluorinated compounds were not included in the SLERA and will be included a separate submittal containing the Chambers Works perfluorinated compound conceptual model. Information should be presented here to explain why this separate submittal was prepared and how it may impact on this Revised SLERA.

The recommendation of Monitored Natural Recovery in the Former Seep Area may not be needed if sediment removal in certain areas of the Salem Canal occur. A cost benefit analysis should be performed to determine if it is cheaper to keep monitoring or to remove the contaminated sediments.

Chemours should present a discussion of sediment COPEC levels in the seep area over time since 2007 sampling event to current as well as include figures. Any exceedances of NJDEP ESCs should be noted.

PFC sampling data points and results should be presented in the SLERA along with the sediment data for previous sampling events. It would be beneficial to see all of the sediment sampling results in one document along with appropriate figures.

#### **Delaware River SLERA Issues - USEPA**

The report states that “demersal fish may also be exposed to COPECs through the direct ingestion of sediment-associated prey and the incidental ingestion of sediment and pore water while foraging in sediment” however these exposure pathways were considered secondary and not quantified. Demersal fish exposure should have been evaluated and quantified in this SLERA using conservative food-chain models since sediments within the Delaware River adjacent to the site contain site-related COPECs.

Section 7 of the report describes the Refined Ecological Exposure Evaluation Approach performed after the SLERA was prepared. USEPA agrees with the use of more representative exposure assumptions in the refined evaluation but does not agree with the development and application of ecological benchmarks that include site-specific inputs. The NJDEP Ecological Evaluation Technical Guidance allows for the use of alternative TRVs “based on site-specific circumstances provided that adequate justification is provided.” This justification should have been presented in a SLERA work plan or technical memorandum before the draft report was submitted so that it could have been adequately reviewed and researched.

HQs greater than one indicate that potential ecological risks may be occurring to ecological receptors of concern. There should be no qualifiers on HQs greater than one or emphasis on HQs greater than or less than 10.

Pore water is one item in a weight of evidence approach and is not “afforded greater weight in estimating exposure and characterizing risk to benthic invertebrate communities.” As stated to Chemours previously, more effective methods to evaluate exposure are toxicity testing, tissue sampling, and bioaccumulation studies.

Section 7.2.3 – This section states that surficial sediment samples from the depth 0 to 2 centimeters from the DIVER database were used to estimate representative background concentrations. This depth which equals less than 1 inch (0.79) is not representative of the site sediment found at depths of 0 – 6 inches and 6 inches to 1 foot.

USEPA does not agree with the Conclusions of this SLERA report. USEPA, NJDEP, and Chemours need to discuss and come to agreement on all outstanding risk assessment issues before the SLERA can be finalized.